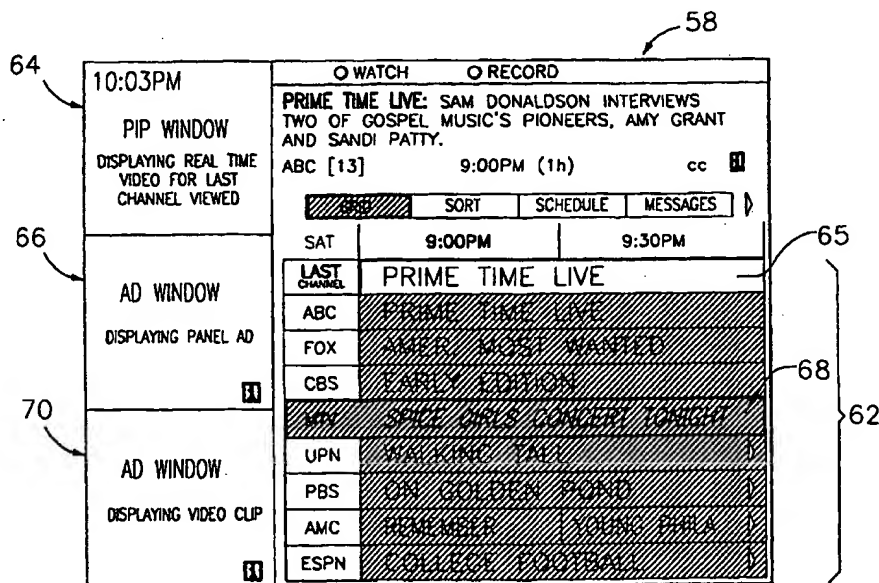




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04N 5/445	A1	(11) International Publication Number: WO 00/21287 (43) International Publication Date: 13 April 2000 (13.04.00)		
<table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> (21) International Application Number: PCT/US99/22723 (22) International Filing Date: 2 October 1999 (02.10.99) (30) Priority Data: 60/102,901 2 October 1998 (02.10.98) US 60/106,667 2 November 1998 (02.11.98) US (71) Applicant (for all designated States except US): STARSIGHT TELECAST, INC. [US/US]; 3rd floor, 39650 Liberty Street, Fremont, CA 94538 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): KLOSTERMAN, Brian, L. [US/US]; 8012 Golden Eagle Way, Pleasanton, CA 94588-3119 (US). (74) Agent: RAHN, LeRoy, T.; Christie, Parker & Hale, LLP, P.O. Box 7068, Pasadena, CA 91109-7068 (US). </td> <td style="width: 50%; vertical-align: top;"> (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> </td> </tr> </table>			(21) International Application Number: PCT/US99/22723 (22) International Filing Date: 2 October 1999 (02.10.99) (30) Priority Data: 60/102,901 2 October 1998 (02.10.98) US 60/106,667 2 November 1998 (02.11.98) US (71) Applicant (for all designated States except US): STARSIGHT TELECAST, INC. [US/US]; 3rd floor, 39650 Liberty Street, Fremont, CA 94538 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): KLOSTERMAN, Brian, L. [US/US]; 8012 Golden Eagle Way, Pleasanton, CA 94588-3119 (US). (74) Agent: RAHN, LeRoy, T.; Christie, Parker & Hale, LLP, P.O. Box 7068, Pasadena, CA 91109-7068 (US).	(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(21) International Application Number: PCT/US99/22723 (22) International Filing Date: 2 October 1999 (02.10.99) (30) Priority Data: 60/102,901 2 October 1998 (02.10.98) US 60/106,667 2 November 1998 (02.11.98) US (71) Applicant (for all designated States except US): STARSIGHT TELECAST, INC. [US/US]; 3rd floor, 39650 Liberty Street, Fremont, CA 94538 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): KLOSTERMAN, Brian, L. [US/US]; 8012 Golden Eagle Way, Pleasanton, CA 94588-3119 (US). (74) Agent: RAHN, LeRoy, T.; Christie, Parker & Hale, LLP, P.O. Box 7068, Pasadena, CA 91109-7068 (US).	(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>			

(54) Title: METHOD AND APPARATUS FOR SUPPLYING VIDEO CLIPS TO VIEWER TERMINALS



(57) Abstract

EPG data (62), advertising messages (66), and video clips (70) relating to the advertising messages are all transmitted to a plurality of user terminals such as television receivers. The video clips are tagged with unique identifiers or words.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

METHOD AND APPARATUS FOR SUPPLYING VIDEO CLIPS TO VIEWER TERMINALS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority of U.S. Application Nos. 60/102,901, filed on October 2, 1998 and 60/106,667, filed on November 2, 1998, the disclosures of which are incorporated fully herein by reference.

BACKGROUND OF THE INVENTION

This invention relates to an on screen interactive electronic program guide (EPG) with advertisements and, more particularly, to coordinating the display of video clips with static advertisements in an on screen EPG.

It is known to display static advertising messages in graphic or textual form in designated areas of an EPG. These advertisements are typically transmitted with the EPG data to user terminals, e.g., television receivers, and displayed on the monitor at the terminal simultaneously with television program listings. An effective advertisement must attract the attention of the television viewer during the period of time that the on screen EPG is displayed.. Live video action is a powerful attention getter. Thus, it would be highly desirable to incorporate live video advertisements into an on screen EPG.

SUMMARY OF THE INVENTION

According to the invention, EPG data, static advertising messages, and video clips relating to the advertising messages are all transmitted to a plurality of user terminals such as television receivers. The video clips are tagged with unique identifiers, e.g., identification numbers or words. The static advertising messages also include the identifiers relating to the respective advertising messages. When an advertising message is scheduled to be displayed in the on screen EPG, its identifier is used to retrieve the corresponding video clip, so the advertising message and the video clip can be displayed simultaneously in the on screen EPG.

A feature of the invention is to transmit the video clips in real time so they do not have to be stored at the user terminals. Preferably, the video clips are transmitted continuously on digital channels; the identifier of each video clip or packet containing video clip information is compared with the identifier of the advertising message scheduled to be displayed, and the video clip or packet containing video clip information is selectively grabbed when the identifiers match.

Another feature of the invention is to transmit the television signals, the EPG data, the

advertising messages, and the video clips as an RF signal or group of signals from a single broadcast or cablecast source.

5 Another feature of the invention is to couple an EPG data base server to a video clip server to append unique identifiers to the video clips and to append the identifiers to the respective static advertising messages prior to transmission to user terminals where the static advertising messages and video clips will be displayed in an on screen EPG .

10 DESCRIPTION OF THE DRAWINGS

The features of specific embodiments of the best mode contemplated of carrying out the invention are illustrated in the drawings, in which:

FIG. 1 is a schematic block diagram of an EPG server and a video clip server connected to a plurality of cable headends that transmit television signals;

15 FIG. 2 is a schematic block diagram of one of the cable headends represented in FIG. 1;

FIG. 3 is a schematic block diagram of one of a plurality of viewer terminals that receive television signals from one of the headends represented in FIG. 2 or another type of television signal transmission source such as over the air or satellite; and

20 FIG. 4 is a diagram of an on screen EPG displayed on a monitor at a viewer terminal in accordance with the invention.

DETAILED DESCRIPTION OF SPECIFIC EMBODIMENTS

The invention is used in conjunction with the interactive electronic program guide (EPG) described in Application No. 08/475,395 filed June 7, 1995 (our Docket No. 27971/LTR/E190) and Application No. 09/120,488 filed July 21, 1998 (our Docket No. 32714/LTR/E190), the disclosures of which are incorporated fully herein by reference.

As shown in FIG. 1, a national video clip server 10 stores video clips to be displayed on the screens of the television monitors of all the viewer terminals that support this interactive EPG. The video clips are typically short, e.g. 10 to 30 seconds, motion picture scenes with or without sound. A national EPG data base server 12 stores program schedule data (including static text based or graphic product, service, or television program advertising messages) to be displayed on the screens of the television monitors of all the viewer terminals that support this EPG. The content of the video clips relate to and further enhance the respective advertising messages, and thus focus the viewer's attention on the subject of the advertising messages.

30 Servers 10 and 12 are connected by a cable, telephone, or wireless transmission link to all the head ends (designated 14) of the cable or broadcast systems that distribute the EPG data with a television signal to transmit EPG data and video clips thereto. Head ends 14 have unique addresses so data can be targeted to a particular head end. Server 12 selectively addresses each

of head ends 14 to furnish EPG data customized to the program lineup and advertising messages for the television viewers served by that particular head end. As represented by an arrow 16, server 12 controls the distribution of video clips by server 10, so server 10 also selectively addresses each of head ends 14 to furnish the video clips relating to the advertising messages transmitted to that particular head end from server 12. The video clips are tagged with unique identifiers or words. The identifier of each video clip is also stored in the EPG data base with the related static advertising message so the video clip can be retrieved later for display at the same time as the static advertising message.

FIG. 2 illustrates the apparatus at one of head ends 14 for carrying out the invention. A head end computer 18 is programmed to coordinate the transmission of video clips and EPG data with television programs over a cable feed 20. An EPG data base receiver 22 selectively grabs the EPG data addressed to the particular head end. Under the control of computer 18 this EPG data is stored in an EPG data base memory 24 and updated one or more times each day. A TV signal source 26 is connected by an EPG data inserter 28 to a multiplexer (MUX) 30 for transmission over cable feed 20. Instead of a cable feed, MUX 30 could be connected to a broadcast antenna, satellite uplink input, etc., depending upon the form of distribution of the television signals. Computer 18 feeds the EPG data stored in memory 24 to inserter 28 for transmission to the viewer terminals with the television signal. Television signals, designated 32, from other sources, i.e. stations, are directly connected to MUX 30. A video clip receiver 34 selectively grabs the video clips addressed to the particular head end. Under the control of computer 18, these video clips are stored on video clip storage disks 36 for use by a video clip server 38. Server 38 furnishes video clips to MUX 30 for transmission over cable feed 20.

Preferably, the video clips are transmitted and stored in compressed digital form, such as MPEG, at national server 10 and at head ends 14. They are also transmitted and stored in reduced size, i.e., one ninth or one quarter of the full screen size. These measures reduce the bandwidth requirements for transmitting the video clips. The television signals could be transmitted in analog or digital form. The implementation of inserter 28 and MUX 30 depends upon the form of the signals, i.e., analog or digital. For example, if the television signals are in digital form, MUX 30 could combine the television signals and the video clips into a single digital stream or several digital streams modulated at different frequencies for transmission together over cable feed 20. If the television signals are in analog form, inserter 28 would be a VBI encoder and MUX 30 would include frequency and amplitude modulators and frequency up-converters to frequency divide the television signals to separate channels. In all cases, the video clips are preferably inserted by MUX 30 on one or more digital channels for transmission over cable feed 20 with the digital or analog television signals.

The video clips are preferably transmitted continuously, i.e., repeatedly, in real time on a plurality of digital channels. As a result, a video clip is always available in real time for display when the corresponding static advertising message is scheduled to be displayed. The channels are digital in the sense that the video clips are carried in a common stream of video data in digital, preferably compressed (MPEG) form in separately tagged packets modulated on one or more carrier frequencies; the packets of each video clip are interleaved with the packets of the other video clips in time division fashion such that the channel carrying the selected video clip can be recovered in real time. Part of the tag of each video clip is the identifier assigned to the video clip at server 10. If the digital channels are modulated on a plurality of carrier frequencies, the identifier must also specify which carrier frequency contains the selected video clip. This could be determined by server 12. Alternatively, the relationship between the carrier frequencies and the identifiers could be assigned at the individual head ends and downloaded to the viewer terminals as a table of carrier frequencies and identifiers along with the EPG data. Alternatively, a plurality of video clips could be transmitted on a single channel in carrousel fashion and the video clip to be displayed could be grabbed and stored in flash memory at the viewer's television terminal during display instead of being available in real time.

FIG. 3 illustrates the apparatus at one of the viewer terminals for carrying out the invention. The viewer terminals could comprise one or more of a television receiver, satellite receiver, VCR, a cable converter, etc. Only the portion of the viewer terminal applicable to the invention is shown. The viewer end of cable feed 20 is connected to a channel selector 40 and a video clip selector 42. Channel selector 40 is coupled by an EPG data extractor 44 to one input of a switch 46. The output of switch 46 is connected to a television monitor 48. A microprocessor 50 controls the disclosed apparatus as well as the remainder of the viewer terminal. If the television signal is transmitted in analog form, channel selector 40 comprises a conventional frequency downconverter, channel frequency tuner, and frequency/amplitude demodulator and data extractor 44 comprises a VBI decoder. Responsive to a viewer input or predetermined time schedule, microprocessor 50 sets channel selector 40 to the desired channel for television reception and/or downloading of EPG data. When EPG data is embedded in the television signal, it is coupled by data extractor 44 to microprocessor 50, which stores the EPG data in an EPG RAM 52 for display on monitor 48 in the EPG mode of operation of the viewer terminal. When the viewer issues commands to microprocessor 50 by means of an input device such as a remote controller, microprocessor 50 retrieves EPG data from RAM 52 and directs the retrieved EPG data to a video processor 54 in which program listings are composed in a bit map corresponding to the pixels on the screen of monitor 48. Channel selector 40 and video processor 54 are coupled to a conventional PIP chip 56. PIP chip 56 is connected to the other input of switch 46. Under the control of microprocessor 50, switch 46 is placed either in a television

viewing mode or an electronic program guide (EPG) mode. In the television viewing mode switch 46 connects channel selector 40 to monitor 48 to display a full screen image of the program on the channel to which selector 40 is set.

In the EPG mode, FIG. 4 illustrates a typical display 58 on the screen of monitor 48. Television program listings occupy an area 62 on the screen. A PIP window occupies an area 64 on the screen. The television program on the channel to which selector 40 is set is displayed in the PIP window in real time and the sound thereof is reproduced by monitor 48. In one mode of operation, as different program listings in area 62 are highlighted by a cursor 65, selector 40 is reset to the corresponding channel so the program is displayed in the PIP window. In another mode of operation, the setting of selector 40 does not change as different program listings in area 62 are highlighted by the cursor, so the program displayed in the PIP window remains unchanged. A static advertising message occupies an ad window area 66 on the screen. If desired, another static advertising message could occupy a program listing area 68 as a "virtual channel" within area 62, instead of one of the television program listings. A video clip is displayed in relatively low resolution reduced size, i.e., not full screen, in an ad window area 70 on the screen as further described below. This low resolution motion picture image requires less bandwidth to transmit and store than a full screen image.

Microprocessor 50 ascertains the identifier of the static advertising message displayed in area 66 or 68 and sends the identifier to video clip selector 42 for comparison with the identifiers of the video clips in the incoming data stream. If there is more than one carrier frequency, selector 42 switches to the correct carrier frequency before comparing the identifiers in the data stream. When a match between the identifiers is found, the video clip is coupled to video processor 54 to be included in the bit map and displayed in area 70, as illustrated in FIG. 4. As described in Application No. 09/120,488, it is desirable to rotate the static advertising messages based on a predetermined plan. Each time a new static advertising message is displayed in the EPG, a new video clip is also recovered from the data stream by microprocessor 50 and displayed in area 70. If there is no video clip available, a static message is displayed in area 70. Thus, the static advertising messages stored in RAM 52 are embellished by the video clips sent to the viewer from the head end.

Although it is preferable to transmit the video clips in a digital data stream on the same communications link as the television signal, i.e., an over the air broadcast, a cable network or satellite system, the video clips could be transmitted to the viewer terminals by a different communications link, e.g., the Internet, a separate data channel, or a direct telephone connection. If an Internet link is used to transmit the video clips, it is possible to selectively transmit only the desired video clip from the video clip server at the Internet site on command from head end computer 18 when the corresponding static advertising message is to be displayed, rather than

continuously transmitting all the video clips. to the viewer terminals.

5 The described embodiments of the invention are only considered to be preferred and illustrative of the inventive concept; the scope of the invention is not to be restricted to such embodiment. Various and numerous other arrangements may be devised by one skilled in the art without departing from the spirit and scope of this invention.

10

15

20

25

30

35

CLAIMS:

- 5 1. A method for supplying video clips to viewer terminals comprising the steps of:
transmitting EPG data and static advertising messages to viewer terminals that have a screen
for display of television programs;
storing the EPG data at the viewer terminals for use in displaying an EPG on the screen;
repeatedly and continuously transmitting a plurality of video clips relating to the static
10 advertising messages to the viewer terminals; and
simultaneously displaying on the screen a) an EPG, b) a static advertising message, and c)
a video clip relating to the static advertising message.
- 15 2. The method of claim 1, additionally comprising the step of transmitting a television
signal from a head end to the viewer terminals.
3. The method of claim 2, in which the step of transmitting EPG data transmits the EPG
data from the head end with the television signal.
- 20 4. The method of claim 3, in which the step of transmitting video clips transmits the
video clips from the head end with the television signal.
5. The method of claim 4, in which the displaying step displays the video clip in real
time without storage at the viewer terminal.
- 25 6. The method of claim 5, additionally comprising the steps of tagging the static
advertising messages with unique identification symbols at the head end, tagging the video clips
with the same identification symbols as the static advertising messages to which they relate,
comparing each video clip transmitted to the viewer terminals with the identification symbol of
30 the static advertising message to be displayed, and using the video clip corresponding to the
identification symbol that matches the identification symbol of the static advertising message to
be displayed as the c) video clip relating to the static advertising message in the displaying step.
- 35 7. The method of claim 6, in which the step of transmitting a plurality of video clips
transmits the video clips in a digital data stream such that the video clips are arranged in
interleaved packets.

8. The method of claim 1, in which the displaying step displays the video clip in real time without storage at the viewer terminal.

5

9. The method of claim 1, additionally comprising the steps of tagging the static advertising messages with unique identification symbols at the head end, tagging the video clips with the same identification symbols as the static advertising messages to which they relate, comparing each video clip transmitted to the viewer terminals with the identification symbol of the static advertising message to be displayed, and using the video clip corresponding to the identification symbol that matches the identification symbol of the static advertising message to be displayed as the c) video clip relating to the static advertising message in the displaying step.

10

10. The method of claim 1, in which the step of transmitting a plurality of video clips transmits the video clips in a digital data stream such that the video clips are arranged in interleaved packets.

15

20

25

30

35

FIG. 1

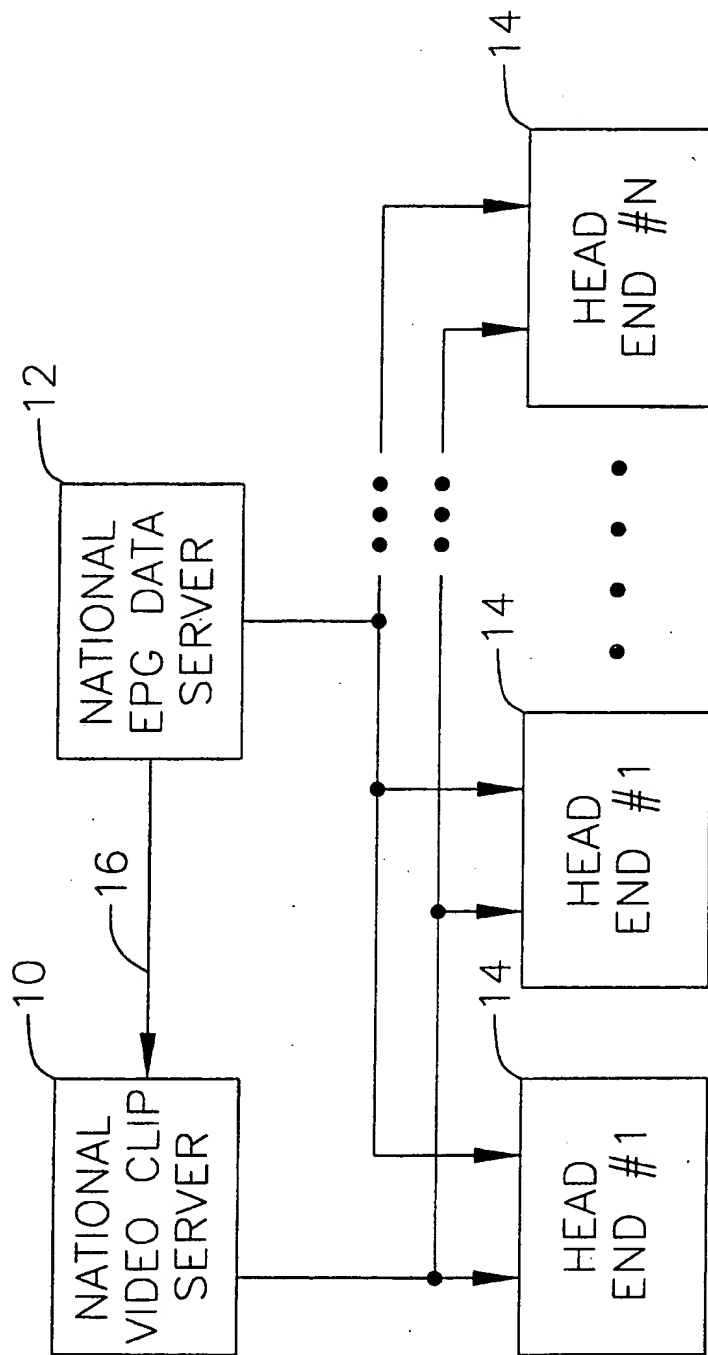


FIG. 2

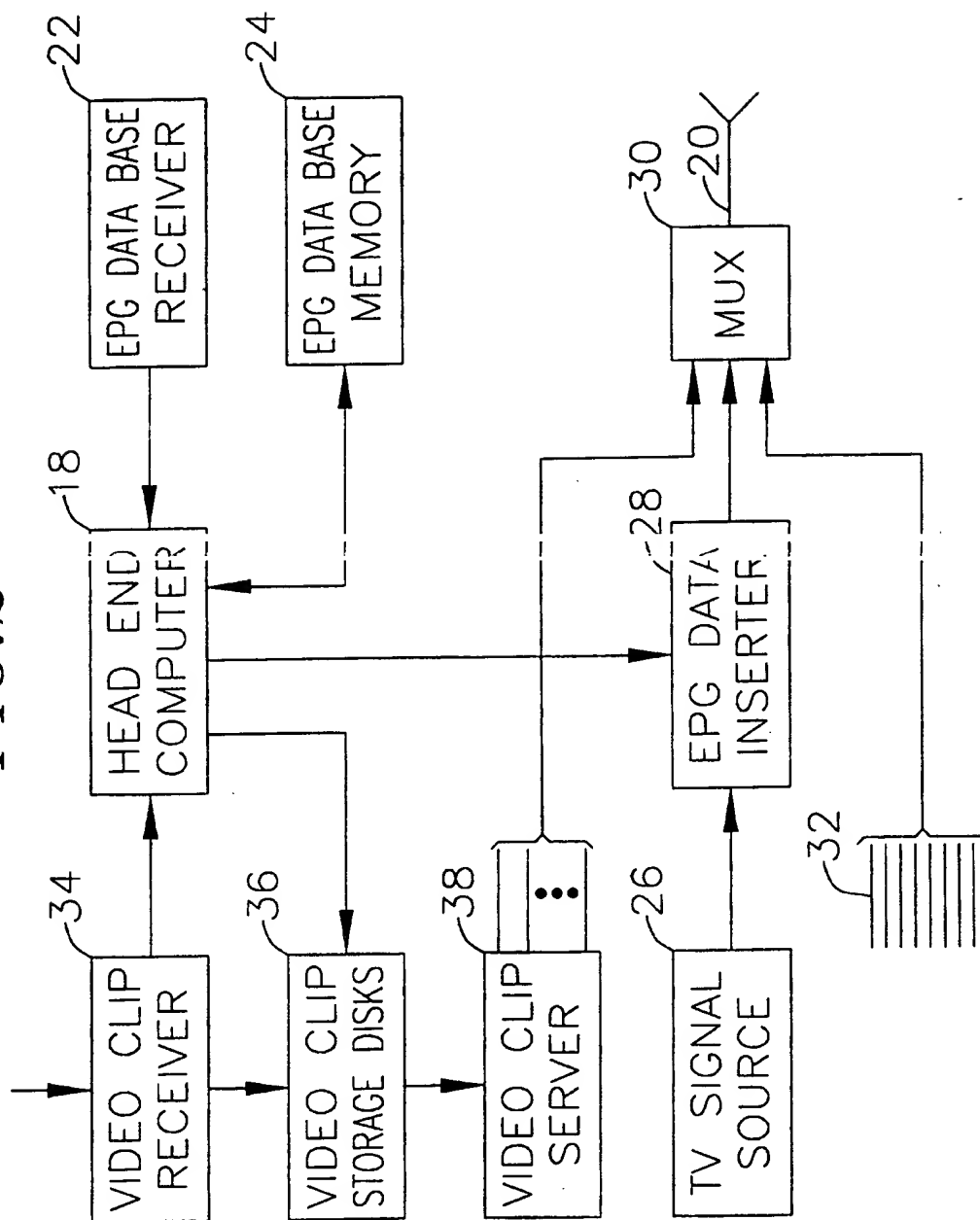
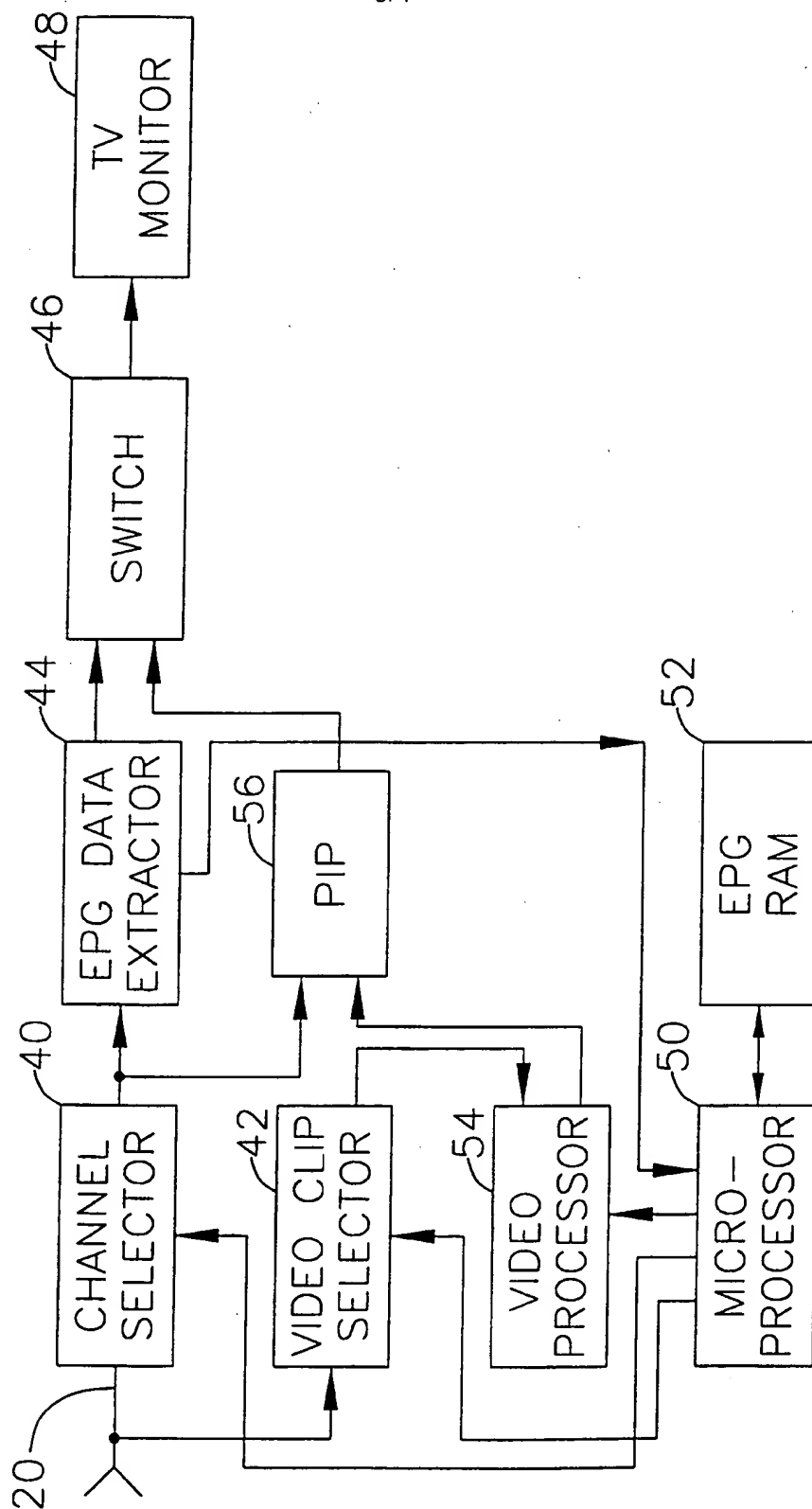


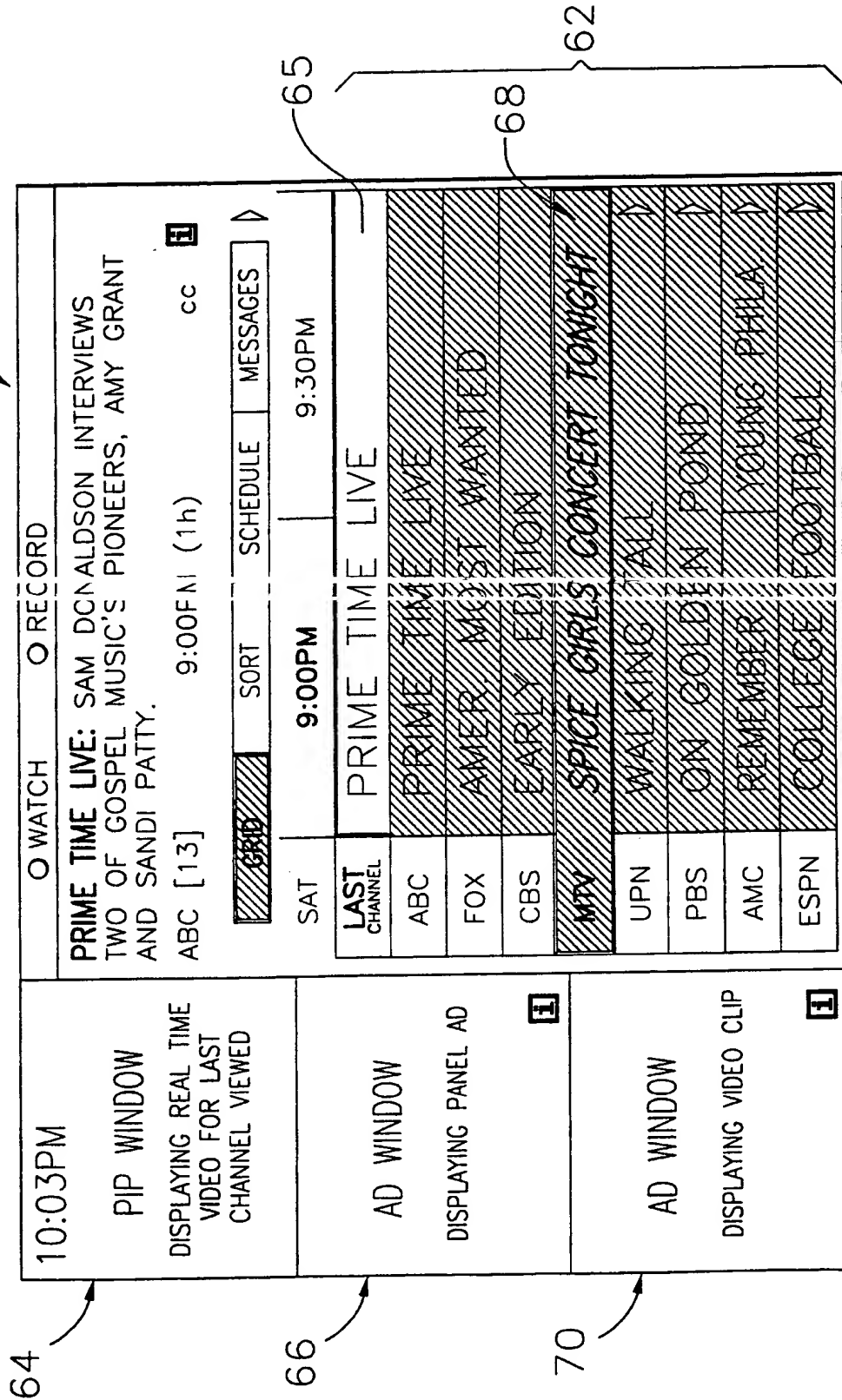
FIG. 3



4/4

FIG. 4

58



INTERNATIONAL SEARCH REPORT

 International application No.
 PCT/US99/22723

A. CLASSIFICATION OF SUBJECT MATTER IPC(6) :H04N 5/445 US CL :348/565, 906, 563 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 348/565, 906, 563; 345/327 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 5,940,073 A (KLOSTERMAN ET AL.) 17 AUGUST 1999, FIGURES 1-27.	1-10
A	US 5,731,844 A (RAUCH ET AL.) 24 MARCH 1998, FIGURES 1-8.	1-10
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
A	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
E	earlier document published on or after the international filing date	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
L	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
O	document referring to an oral disclosure, use, exhibition or other means	*G* document member of the same patent family
P	document published prior to the international filing date but later than the priority date claimed	
Date of the actual completion of the international search 17 DECEMBER 1999		Date of mailing of the international search report 03 FEB 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230		Authorized officer NATHAN J. FLYNN Telephone No. (703) 305-3900 <i>Jane Hill</i>

THIS PAGE BLANK (USPTO)